2.0 DESCRIPTION OF THE PROPOSED ACTION

2.1 INTRODUCTION

The Proposed Action and subject of this EIS is the Construction and Operation of the NBACC Facility by the DHS at Fort Detrick, Maryland, on a Site Adjacent to Existing USAMRIID Facilities (Alternative I, the preferred alternative). This EIS describes environmental concerns potentially resulting from the proposed activities. A brief description of the Proposed Action is presented in Section 2.2 below, followed by extended discussions in Section 2.3 of the potential environmental impacts of the proposed construction and operational activities and the policies, procedures, and operational and engineering controls designed to mitigate (i.e., avoid, lessen, or eliminate) those impacts.

2.2 LOCATION OF THE NBACC FACILITY

The proposed NBACC Facility will provide approximately 160,000 gross square feet (gsf) of floor space for biological threat characterization and bioforensic operations and research laboratories, animal facilities, mechanical equipment, a waste handling area, and administrative support offices. The building footprint will cover a total of approximately 80,000 square feet ($ft.^2$) (1.84 acres), and approximately 112,200 $ft.^2$ (2.58 acres) of loading dock apron, miscellaneous sidewalks, landscaping, paved parking, and access roads will be associated with the building.

Figure 2–1 is a map of Area A of Fort Detrick showing the proposed site of the NBACC Facility. Figure 2–2 shows the immediate vicinity of this site, including the adjoining NIAID IRF, currently under design, and the planned national Interagency Biodefense Campus (NIBC) Parking Lot. The site currently consists of relatively flat undeveloped grassland, as can be seen in the foreground of Figure 2–3, Figure 2–4, Figure 2–5, Figure 2–6, Figure 2–7, Figure 2–8, Figure 2–9, and Figure 2–10 (photographs showing views of the proposed site looking toward the north, northeast, east, southeast, south, southwest, west, and northwest respectively). Aerial photographs of the site are also provided in Appendix E and Appendix F. Electrical power distribution lines (12-kilovolt [kV] service), which traverse the NIBC in a north-south alignment, appear in the background of Figure 2–3 and Figure 2–4. These power distribution lines may be relocated in the future. The Allegheny Power Company 230-kV power transmission lines, which traverse the NIBC in a general northwest-to-southeast direction, are seen in the background of Figure 2–5. Forested land to the north of the proposed NBACC Facility site appears in the distant background in Figure 2–3 and Figure 2–10.

2.3 PROPOSED ACTIVITIES

The Proposed Action involves the construction and operation of the NBACC Facility by the DHS at Fort Detrick, Maryland, on land that is owned by the U.S. Army. The proposed NBACC Facility will provide the DHS with much-needed biological threat characterization and bioforensic operations and research laboratory facilities to fulfill its mission requirements (see Sections 1.1, 1.2, and 2.2).

The construction phase of the project may take up to two and a half years. It is anticipated that groundbreaking will occur in the first quarter of calendar year (CY) 2006. Potential

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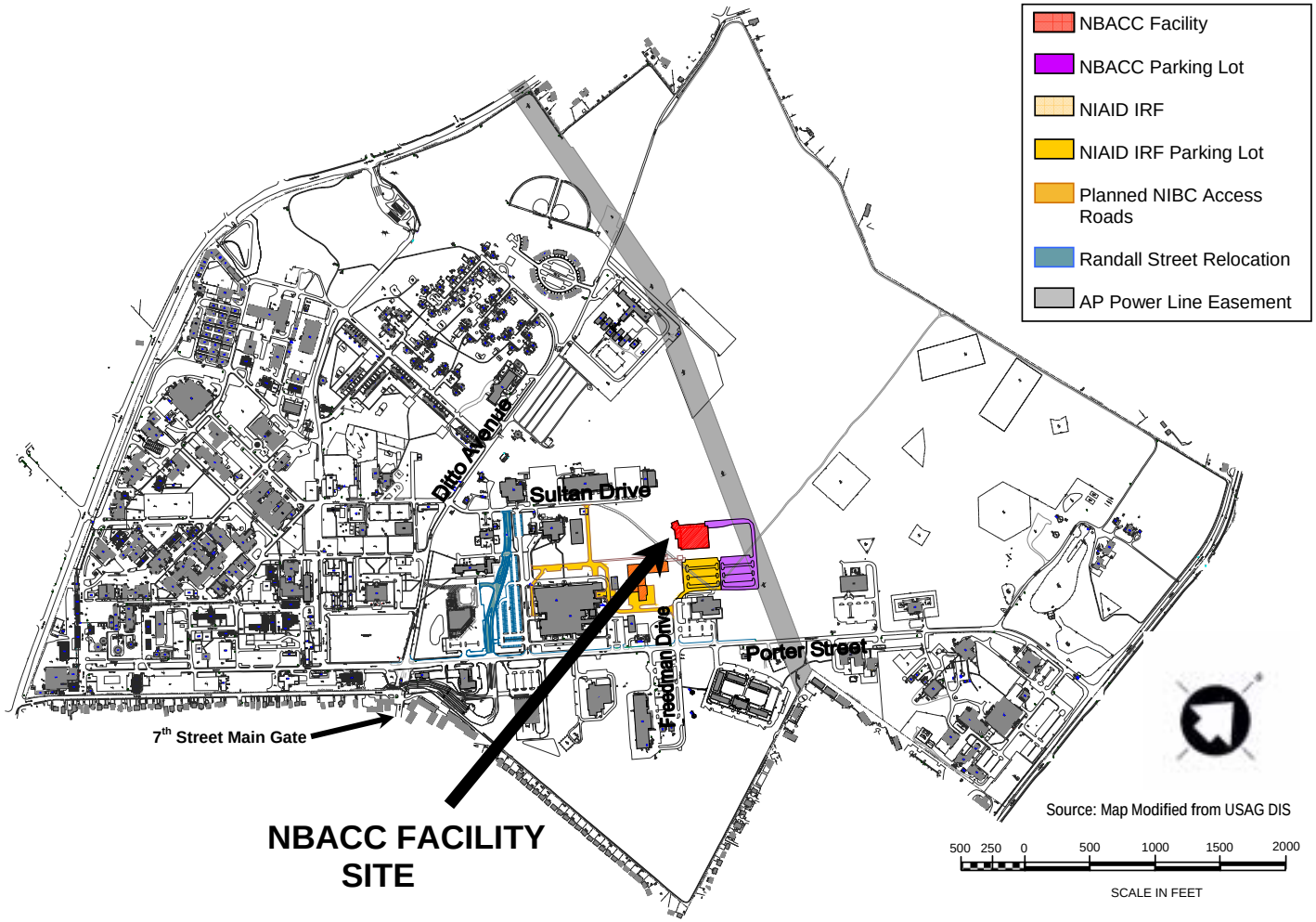

Figure 2–1. Location of the Proposed Site of the NBACC Facility on Area A of Fort Detrick, Maryland.

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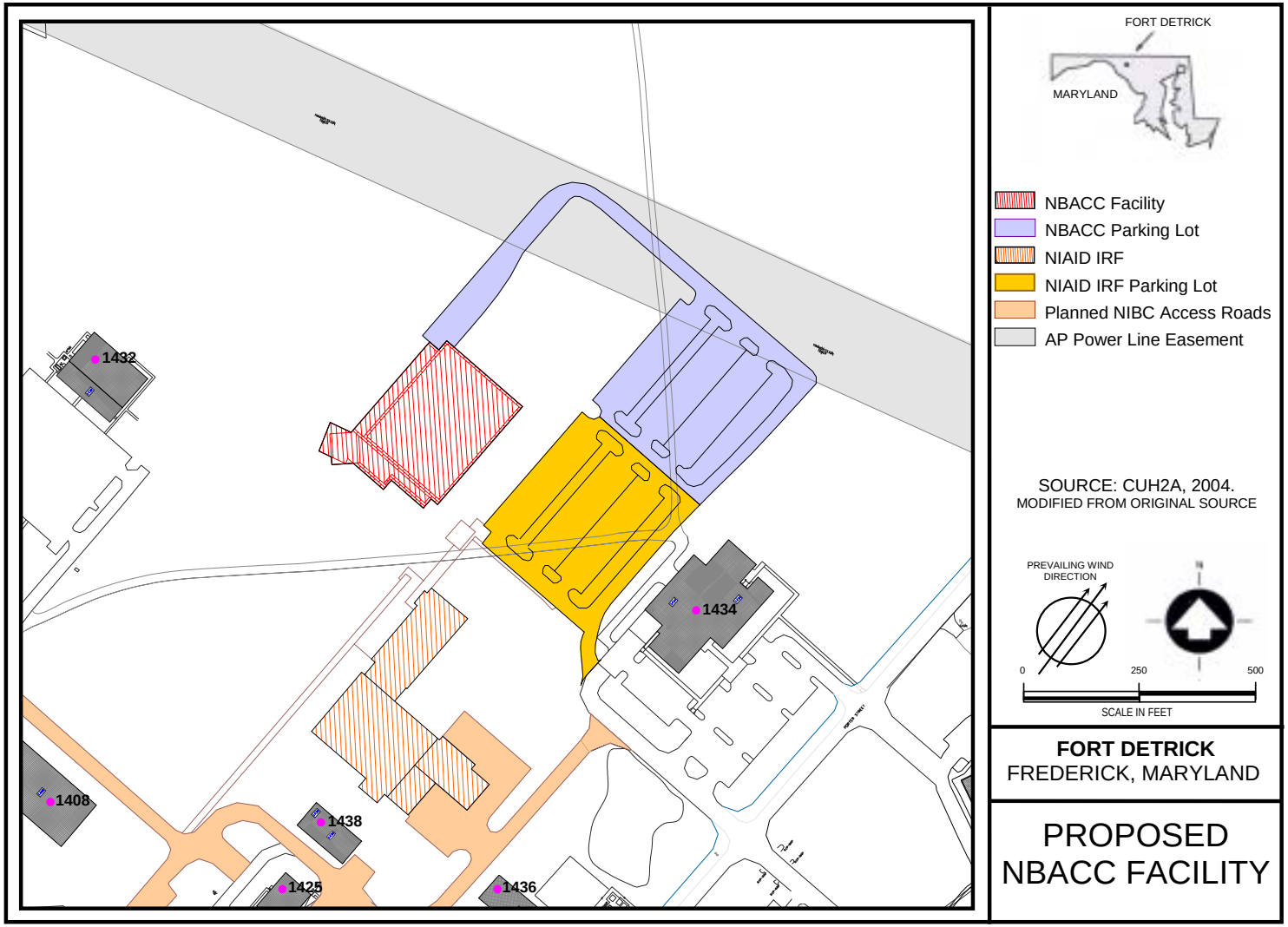

Figure 2–2. Proposed NBACC Facility Site.

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Figure 2–3. Proposed NBACC Facility Site – Facing North (Forest Block 1 appears in the background).

Figure 2–4. Proposed NBACC Facility Site – Facing Northeast.

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Figure 2–5. Proposed NBACC Facility Site – Facing East (Building 1435 appears in the background).

Figure 2–6. Proposed NBACC Facility Site – Facing Southeast (Building 1434 appears in the background).

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Figure 2–7. Proposed NBACC Facility Site – Facing South.

Figure 2–8. Proposed NBACC Facility Site – Facing Southwest (Building 1408 appears in the background).

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Figure 2–9. Proposed NBACC Facility Site – Facing West (towards Building 1432).

Figure 2–10. Proposed NBACC Facility Site – Facing Northwest.

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environmental impacts during construction and the mitigation mechanisms (regulatory requirements and constraints) are discussed in Section 2.3.1.

Utility consumption and waste stream management are discussed in Sections 2.3.2 and 2.3.3, respectively. Mitigation mechanisms for safety and security issues are presented in Section 2.3.4, with particular attention to biological safety and etiologic agents (Etiologic agents can be defined as microorganisms capable of causing disease.)

The research conducted at the proposed NBACC Facility will serve to understand the threats that may be used against the United States in a biological attack. Certain operational activities in the proposed NBACC Facility consist of research on specific pathogens and involve risk of exposure to potentially hazardous biological agents for laboratory workers and the outside environment. This risk of exposure would be similar to the risk of exposure at facilities used for medical research to control diseases.

The CDC has developed facility design and operational guidelines for facilities used to conduct the type of research to be performed at the NBACC Facility. The laboratories will be comprised of biological containment suites designed and constructed to BSL-2, 3, and 4 [2]guidelines and incorporating special engineering features as provided in *Biosafety in Microbiological and Biomedical Laboratories* (BMBL) (CDC/NIH, 1999), which will enable DHS researchers to conduct the research and forensics programs safely and protect the outside environment (see Sections 2.3.4.1 and 2.3.4.2).

2.3.1 CONSTRUCTION REGULATIONS AND CONSTRAINTS

The approval of a site for new construction at Fort Detrick is contingent on a number of factors. Use of the project location must conform to the Installation's land planning and development principles, and safety and environmental concerns must be addressed.

Adherence to construction design standards will assure that the proposed NBACC Facility will be safe, sound, and functional. Many of these design parameters, which specify guidelines for features such as layout, structural integrity, and aesthetics, are based on national codes (e.g., American National Standards Institute (ANSI) /American Society of Civil Engineers (ASCE); National Fire Protection Association (NFPA); and Building Officials and Code Administrators (BOCA) that were established to ensure the durability of structures, and hence, to guarantee the safety of occupants and people in surrounding areas.

Most construction traffic likely will enter the proposed NBACC Facility site via Sultan Drive or Freedman Drive and a paved access road (see Figure 2–11 and Figure 2–12). Construction workers may park in Area B and be bused to and from the proposed NBACC Facility site to mitigate potential impacts to parking and traffic during the construction phase.

[2] "Biosafety Levels" is a system of well-defined safety facilities, equipment, and procedures established to minimize risk of exposure to potentially hazardous agents for laboratory workers and the outside environment.

2.3.1.1 Site Selection Regulations

Evaluation of the proposed location for the NBACC Facility followed guidelines outlined in AR 415-15, *Army Military Construction Program Development and Execution*, dated 25 October 1999. This regulation provides requirements and guidelines for the implementation of construction projects on Army Installations.

AR 405-80, *Management of Title and Granting Use of Real Property*, dated 11 November 1997, regulates granting use of real property controlled by the Department of the Army (DA), including delegating authority to issue outgrants authorizing the use of such real property by non-Army users. The Secretary of the Army has the authority to grant the use of real property under his administrative control. The Assistant Secretary of the Army (Installations, Logistics and Environment) has the primary responsibility for DA real estate programs. A Report of Availability (ROA) and an Environmental Baseline Survey (EBS) must be prepared by USAG as required by AR 200-1 and Department of the Army Pamphlet (DA PAM) 200-1. ROAs contain information needed for the review and approval of availability and for the preparation of legal documents such as leases. The Assistant Chief of Staff for Installation Management makes a Determination of Availability prior to issuing outgrants, such as leases.

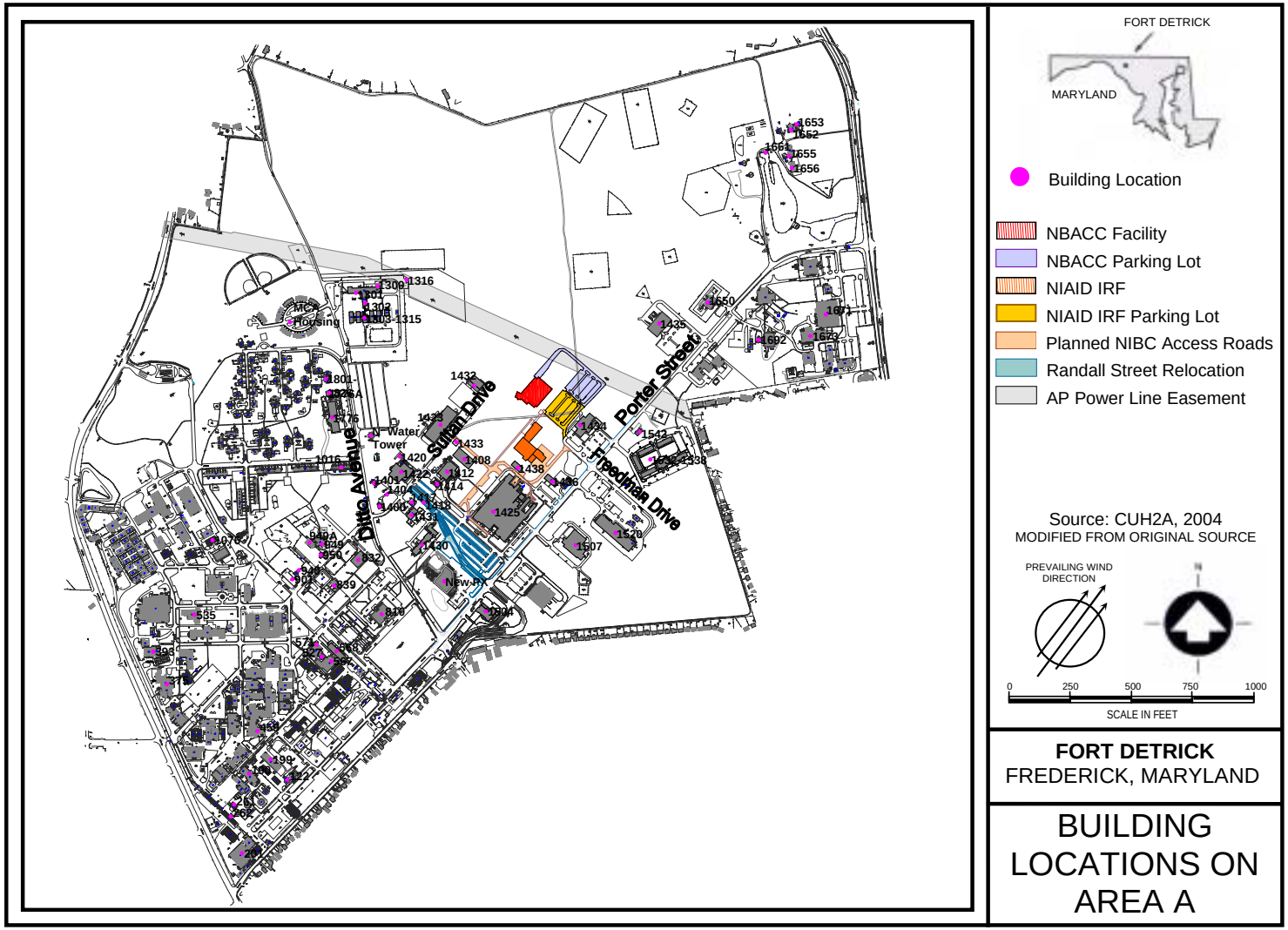
AR 210-20, *Master Planning for Army Installations,* dated 30 July 1993, requires that all installations maintain a planning board. The Fort Detrick Real Property Planning Board (RPPB) consists of representatives from the command, operational, engineering, and planning divisions of the Installation and tenant activities. The RPPB evaluates master planning documentation, approves new construction sites and projects, and reviews the progress and status of major construction projects.

2.3.1.2 Environmental Baseline Survey

The DHS and USAG conducted an EBS to characterize the existing environmental conditions on and around the southern portion of the NIBC at Fort Detrick (DHS and USAG, 2004), including the proposed location for the NBACC Facility. Information from the EBS is also included in the discussion of the Affected Environment in Section 4.1 through Section 4.18 of this EIS. The EBS provided some evidence that environmental conditions may affect the methods, scope, and timing of the development options for the proposed site of the NBACC Facility. Several potential environmental planning concerns were identified, as follows:

The nature of the geology and soils within the southern portion of the NIBC may affect land use and development. Fracture traces and/or potential sinkholes are of concern as potential pathways for the migration of groundwater contamination. Specific EBS findings regarding geology and soils include:

- A photogeological analysis by the U.S. Army Corps of Engineers (USACE) revealed the presence of fracture traces and sinkholes throughout Area A. None of these sinkholes is on or near the proposed site of the NBACC Facility, but one of the fracture traces traverses the central part of the site (see Sections 4.3.3 and 4.3.4).
- The regional geology underlying Area A is fractured limestone and dolomite of the Frederick Formation, which has been known to develop karst features such as sinkholes.



FORT DETRICK

MARYLAND

- Building Location
- NBACC Facility
- NBACC Parking Lot
- NIAID IRF
- NIAID IRF Parking Lot
- Planned NIBC Access Roads
- Randall Street Relocation
- AP Power Line Easement

FORT DETRICK
FREDERICK, MARYLAND

BUILDING LOCATIONS ON AREA A

Figure 2–11. Location of Select Buildings Relative to the Proposed NBACC Facility Site.

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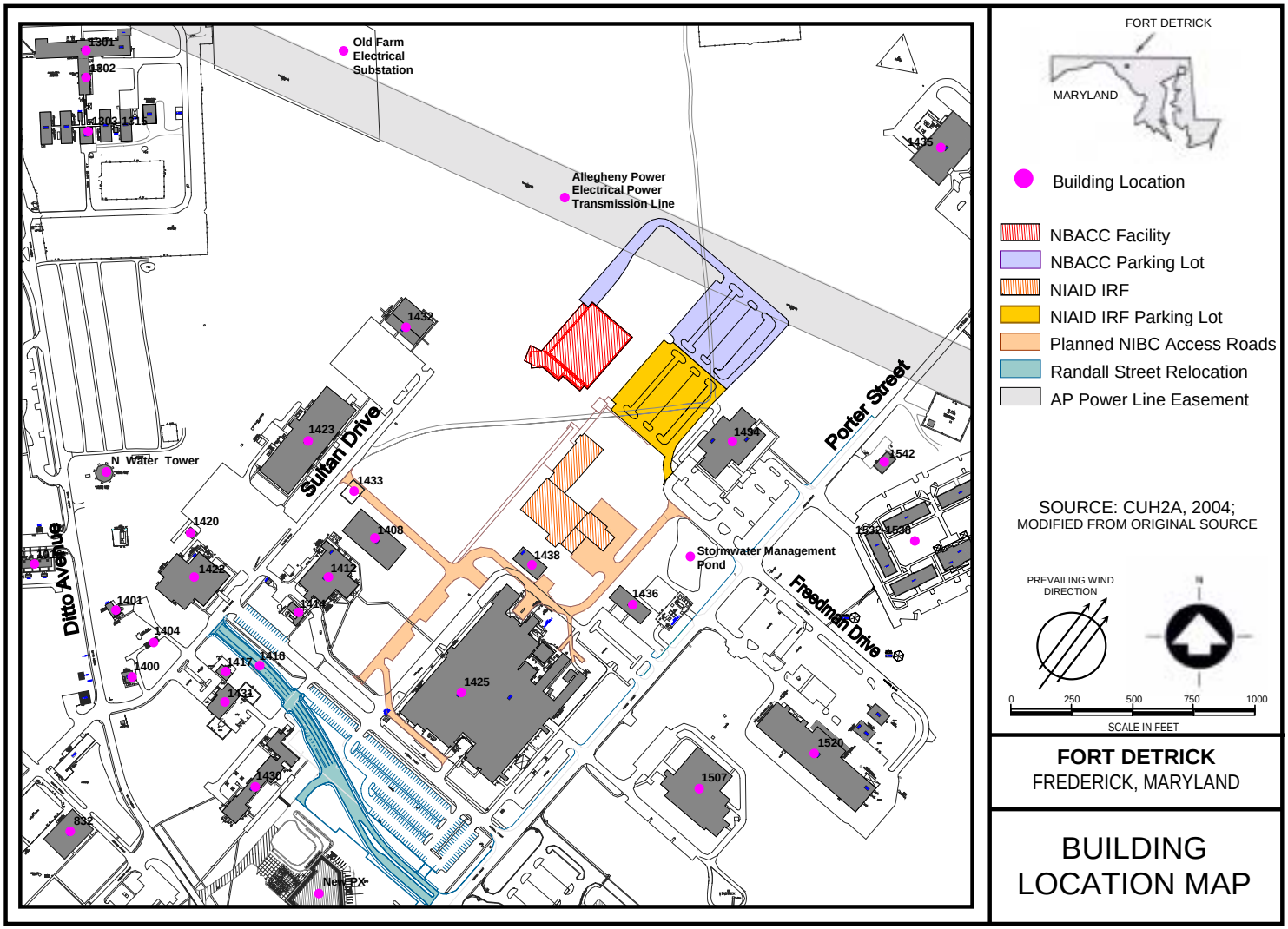

Figure 2–12. Building Locations of the Proposed NBACC Facility Site.

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- The pre dominant soils at the NIBC are Duffield series (silt loams), which are characteristic of karst landscapes with a potential for sinkhole development.

Stormwater management issues will affect the land use and development of the southern portion of the NIBC. Most of the land in that area slopes from northwest to southeast. Specific EBS findings regarding stormwater include:

- The area within that part of the campus covered by impervious surfaces is estimated to significantly increase upon completion of the build-out.
- The volume of stormwater runoff, particularly from the eastern side of the campus where most of the new building is planned, will increase. A stormwater management study is underway.

Forestation and reforestation will be required as a result of the proposed activities on the NIBC.

Potential release of biological agents from the Laboratory Sewer System (LSS) would be of concern, although there is no evidence that such a release has occurred. Specific EBS findings regarding the LSS include:

- Construction or demolition activities affecting the LSS are not anticipated in the near future. The LSS serves USAMRIID facilities (Buildings 1408, 1412, and 1425) and the U.S. Department of Agriculture (USDA) Building 374 greenhouse complex, and it remains in operation pending funding for it to be decommissioned.
- The area potentially affected by such a release is at the south end of the NIBC (Buildings 1408, 1412, and 1425) and further to the southwest, away from the area of proposed construction (approximately 800 feet [ft.] from the proposed site of the NBACC Facility).

Air permitting issues also are likely to affect development of the southern portion of the NIBC since the Frederick region is in nonattainment for ozone. Specific EBS findings regarding air permitting include:

- Criteria pollutant emissions (e.g., nitrogen oxides and sulfur dioxide) will be increased as a result of additional steam boiler and incinerator operation.
- New Source Review/Prevention of Significant Deterioration (NSR/PSD) may be required under Title V of the Clean Air Act (CAA).
- A Conformity Analysis in accordance with the CAA will be required.

Potential environmental impacts could result from increased traffic/parking burdens in the southern portion of the NIBC. Specific EBS findings regarding traffic and parking include:

- Environmental impacts include increased amounts of air pollution and traffic.
- Because traffic conditions in the area adjacent to the Installation are anticipated to deteriorate by 2007, detailed traffic studies may be needed to mitigate the impacts of NIBC traffic congestion and emissions on the surrounding community.

Electromagnetic fields on the NIBC will be elevated in localized areas from the Old Farm Substation located north of Building 1301, the existing Allegheny Power 230-kV transmission

lines,
and the
electrical substation located south of Building 1434, which is slated for expansion. Specific EBS findings regarding electromagnetic fields include:

- An authoritative report issued in 1999 under the auspices of the National Institute of Environmental Health Sciences (NIEHS) noted that evidence from epidemiological studies suggests “small increased risk with increasing exposure” associated with two forms of cancer, childhood leukemia and chronic lymphocytic leukemia in occupationally exposed adults. However, the NIEHS report indicated that results of laboratory (animal and human) toxicology and mechanistic studies fail to indicate a cause-and-effect relationship between exposure to electromagnetic fields at environmental levels and disease.
- Various electronic equipment, as well as magnetic data carriers, may be affected by magnetic fields, including cathode ray devices, electronic implants such as cardiac pacemakers, computers, magnetic storage media, and credit cards. Analog watches may also be affected. The USDA reports that some laboratory equipment at the USDA complex (Buildings 1301-1316) apparently has been affected since the Old Farm Substation became operational.

Available evidence suggests that known past uses on and adjacent to the EBS subject site are unlikely to significantly impact the development of the parcel. Specific EBS findings regarding known past uses on and adjacent to the EBS subject site include:

- A previously unknown 2-acre disposal site, located within the proposed footprint of the NBACC Facility (approximately 400 ft. northwest of Building 1434), was revealed by an airborne geophysical survey during 2001. The presence of buried materials was suspected, and subsequent investigations by visual reconnaissance, a ground-level electromagnetic sweep, and a trenching study indicated that the site had been used for the disposal of construction and/or demolition debris. Soil samples from the site had contaminant concentrations within background levels of the area.
- An approximately 6-acre area including portions of the proposed site for the NBACC Facility and the site of the NIAID IRF was used for outdoor testing of a biological simulant during 1953-1955. The previously unknown 2-acre disposal site discussed above lies within the former outdoor testing area. The simulant used was *Serratia marcescens*, a human pathogen responsible for a large percentage of nosocomial (hospital-related) infections. Human infections attributable to *S. marcescens* outside of hospital settings are uncommon.
- The site of a former recreational skeet range adjoins the NIBC on the southeast. A small portion of the campus near Building 1434, approximately 335 ft. southeast of the proposed NBACC Facility site, may have been affected. Residues of lead in the soil at this area were slightly elevated with respect to background levels but well below Maryland Department of the Environment (MDE) risk-based concentration limits for residential or industrial land use, and remediation was not deemed necessary.

2.3.1.3 Construction Waste Management

All wastes resulting from the construction of the NBACC Facility will be managed in accordance with Federal, DA, USAG, and state requirements. The contractor must make every effort to reduce overall construction waste by recycling materials whenever possible. The contractor must comply with AR 200-1, *Environmental Protection and Enhancement*, dated 21 February 1997, paragraph

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) and 10 U.S. Code Section 2692 in regards to storage, treatment, and disposal of non defense toxic and hazardous materials and dispose of all waste generated during construction at an approved facility off the Installation.

2.3.1.4 Stormwater Management, Erosion, and Sediment Control

Stormwater management measures are required for projects that disturb more than 5,000 ft.^{2} on Federal property according to Code of Maryland Regulations (COMAR) 26.17.02 and the *Maryland Stormwater Management Guidelines for State and Federal Projects*, July 2001. The stormwater management facilities will be designed consistent with the *2000 Maryland Stormwater Design Manual* Volumes I and II (MDE, 2000a) and will be constructed in accordance with a project plan approved by the MDE. Best Management Practices (BMPs) for stormwater management, including ponds, wetlands, infiltration, filtration, open channels, or a combination thereof, will be used with the approval of MDE. Extended wet detention ponds, sand filtration and open channels are the most feasible options for stormwater management, due to certain ecologic (West Nile Virus), geologic (karst geology), and climatic (drought) conditions at Fort Detrick.

An erosion and sediment control plan for land clearing, grading, or other earth disturbance approved by the MDE is required under COMAR 26.17.01 for construction activities involving more than 100 cubic yards or more than 5,000 ft.^{2} During construction, application of BMPs for construction will minimize soil erosion and potential airborne particulate matter, in compliance with State regulations pertaining to “Particulate Matter from Materials Handling and Construction” (COMAR 26.11.06.03D). If the area disturbed is more than one acre, a general permit under the National Pollutant Discharge Elimination System (NPDES) is also required (Dimarco, 2002; Silvestri; 2002b, 2003b). Construction of the proposed NBACC Facility will permanently disturb approximately 7.07 acres, and includes approximately 4.15 acres of impervious surfaces (see Table 2-1).

BMPs for sediment and erosion control will be implemented to preserve the water quality of the Monocacy River. The purpose of Maryland’s erosion/sediment control and stormwater management programs is to reduce stream channel erosion, pollution, siltation and local flooding caused by land use changes associated with urbanization. A floodplain study is presently being conducted in Area A (Lewis, 2004a); however, the site of the proposed NBACC Facility lies approximately 2,600 ft. from the nearest currently known 100-year floodplain (Federal Emergency Management Agency, 1978).

Presently, stormwater runoff from the southern portion of the NIBC drains towards the Barquist Army Health Clinic (Building 1434) and the small stormwater retention pond located immediately south of it (see Section 4.5.3; U.S. Geological Survey [USGS], 1993; DA, Directorate of Installation Services [DIS], 2001). Future grading will divert stormwater runoff from the proposed NBACC Facility site away from the existing retention pond and towards a planned stormwater management pond that will be located northeast of Building 1434. A study evaluating stormwater management options for the south-central portion of Area A is currently being conducted to determine the feasibility for regional stormwater management plans. Stormwater management plans currently under development will have to be approved by the MDE.

As outlined in Executive Order (EO) 13148 dated 26 April 2000 *Greening the Government through Leadership in Environmental Management*, all agencies are directed to incorporate what has come to be known as the low impact development (LID) approach to land development and stormwater management into landscape programs, policies, and practices (USEPA Office of the Federal Environmental Executive, 1995).

Table 2-1. Projected Permanent Land Disturbance for NBACC Facility Construction.

PERMANENT DISTURBANCE	SQUARE FEET[1]	ACRES
IMPERVIOUS AREAS		
NBACC Facility Footprint	80,000	1.84
NBACC Facility Concrete Loading Dock Apron	5,400	0.12
NBACC Facility Parking Lot	81,300	1.87
NBACC Facility Miscellaneous Sidewalks	2,100	0.05
Access Road To NBACC Facility Loading Dock	11,700	0.27
Subtotal Impervious Areas	**180,500**	**4.15**
NON-IMPERVIOUS AREAS		
Disturbed Area From Construction Activities	115,900	2.66
Landscaping[2]	11,700	0.27
Subtotal Non-Impervious Areas	**127,600**	**2.93**
TOTAL LAND PERMANENTLY DISTURBED	**308,100**	**7.07**

[1]Individual square footage values have been rounded.
[2] Landscaping assumes a 10 ft. planting bed at the edge of the building footprint.
Source: CUH2A, 2004

LID is an innovative approach to urban stormwater management, one that does not rely on the conventional end-of-pipe or in-the-pipe structural methods but instead integrates stormwater controls throughout the urban landscape. It includes the following site design goals and planning practices to decrease the runoff volume and increase the travel time of water off the site (time of concentration) (Prince Georges County, Maryland Department of Environmental Resources, 1999):

- Minimize direct stormwater impacts to streams and wetlands, as much as possible, by locating stormwater facilities outside of streams and wetlands, by maintaining natural drainage routes, by preserving riparian buffers, and by using distributed “integrated management practices” (IMPs) such as bioretention, dry wells, filter/buffer strips, vegetated swales, or infiltration wells in lieu of centralized ponds.
- Preserve natural cover on as much of the site as possible, especially for areas located on hydrologic soil groups A (sand, loamy sand or sandy loam) and B (silt loam or loam), by using clustered development designs; by limiting the clearing and grading of forests and native vegetation to the minimum area needed for construction, necessary access, and fire protection (“fingerprint” clearing); and by avoiding impacts to wetlands or vegetated riparian buffers.
- Minimize overall impervious cover by using the minimum required width for streets and roads; by minimizing excess parking space construction; by using pervious pavers in low-use parking areas; by substituting pervious surfaces for impervious wherever

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ssible; by using vegetated open swales rather than curb and gutter, when permitted, preferably "engineered" swales with a permeable soil base; and by minimizing compaction of the landscape due to heavy construction equipment.

- Locate IMPs that promote infiltration on hydrologic soil group A and B soils wherever possible.
- Locate impervious areas on less permeable soils (hydrologic soil groups C and D) to minimize the potential loss of infiltration/ recharge capacity on the site.
- "Disconnect" impervious areas – have impervious cover drain to pervious cover (e.g., downspouts draining to the yard, not the driveway).
- Increase time of concentration by flattening grades for stormwater conveyance to the minimum sufficient to allow positive drainage; by using circuitous flow routes, rough vegetation, and check dams in vegetated swales; and by using "engineered" swales rather than sewer pipes or hardened channels.
- Use soil management/enhancement techniques to increase soil absorption, including delineation of soils on-site for the preservation of infiltration capacity; requiring compacted soils in areas receiving sheet flow runoff (e.g., yards, down slope or downspouts); and specifying that the affected soils will be disked prior to seeding and amended with loam or sand to increase absorption capacity.
- Revegetate all cleared and graded areas with native and noninvasive species
- Use level spreading of flow into natural open space.

2.3.1.5 Forest Conservation and Cultural Resource Requirements

Any project that disturbs over 40,000 ft.^{2} (0.92 acres) of unforested land must afforest (convert open land by planting trees or seeds) 15 percent of the equivalent surface area. The Maryland Department of Natural Resources (MDNR) must approve forestation plans before the project can break ground. The MDNR Forest Service can visit Fort Detrick at any time to inspect for compliance. Planting will occur at a rate of 436 trees per acre. The average survival after a two-year period after planting is approximately 75 percent. Planting can occur from the beginning of the project to the end (Boyland, 2003a).

In compliance with the obligation for forest conservation, for the total land disturbance of approximately 7.07 acres (307,969 ft.^{2}), afforestation of a total of 1.06 acres will be necessary for the NBACC Facility project. To meet this requirement, the DHS has proposed reforestation and afforestation plantings at another area of Fort Detrick. These plantings will contribute to the growth and development of the designated forest areas within the Installation.

Prior to construction activities, the Maryland Historical Trust must conduct an investigation to determine if there will be an adverse impact to nearby existing designated historical sites. The closest such site is Building 1412, approximately 846 ft. southwest of the proposed NBACC Facility site, which has been designated by the USAG as eligible for listing in the National Register of Historic Places (NRHP). Other, more distant, cultural resources on Area A include four structures currently listed in the NRHP and several archeological sites identified in the EBS that have been evaluated previously and found lacking in historic value (DHS and USAG, 2004).

The project will require USAG to consult with the State Historic Preservation Office (SHPO) because of the historical significance of these sites (see Section 4.9). Any requirements identified by the SHPO to mitigate potential effects to these sites will be followed.

2.3.1.6 A
i
r Quality Requirements

Fort Detrick is located in a severe ozone (O_3) non-attainment area. Because nitrogen oxides (NO_x) and sulfur dioxide (SO_2) emissions at Fort Detrick potentially surpass the threshold levels of 25 and 100 tons per year (tpy), respectively, Fort Detrick is considered a “major source” for permitting purposes under the CAA (Wolf, 2002a). The CAA requires that a NSR evaluation be prepared before construction and installation of any new permitted major sources or any major modifications of permitted major sources in non-attainment areas that have the potential to cause significant increases of criteria pollutants (NO_x, sulfur oxides (SO_x), carbon monoxide (CO), lead (Pb), volatile organic compounds (VOCs), and particulate matter (PM)).

The CAA also requires that a PSD evaluation be prepared before construction and installation of certain types of listed sources in attainment areas that have the potential to emit certain threshold quantities of criteria pollutants. USAG recently conducted a conformity review. Air quality permits to construct are required for generators greater than 1,000 horsepower (hp) or 746 Kilowatt (kW) and for fuel burning equipment greater than or equal to 1 Million British Thermal Units(MMBtu) per hour. Air quality permits to operate are required for fuel burning equipment and hot water heaters with maximum rated capacities of 50 MMBtu per hour or more (COMAR 26.11.02). Auxiliary (combustion) equipment in the proposed NBACC Facility may include a boiler, a standby generator, and a water heater. A Conformity Analysis in accordance with the CAA will be required.

2.3.2 UTILITY REQUIREMENTS FOR ROUTINE OPERATIONS

Energy management practices of the proposed NBACC Facility will follow guidelines set forth in EO 13123, *Greening the Government Through Efficient Energy Management*, 08 June 1999. Activities in the proposed NBACC Facility are expected to be similar to those of the existing USAMRIID facilities. On that basis, the projected utility consumption by the NBACC Facility is assumed to be proportional on a square foot basis to those of USAMRIID facilities (see Table 2-2), as documented in the Installation Master Plan (USAG, 2003a). The operational details of utility requirements will be established in an interservice support agreement between DHS and USAG.

2.3.2.1 Water Supply

In Fiscal Year (FY) 2002, Fort Detrick’s Water Treatment Plant (WTP) produced approximately 473 million gallons (gal) of water. The quality of the drinking water supply provided by the Installation met or exceeded all Federal (Clean Water Act [CWA]), state (COMAR 26.04.01), and DA criteria (Grams, 2002). The Installation’s Water Withdrawal Permit limits the WTP to an average of 2.0 million gallons per day (mgd) from the Monocacy River. The WTP peak instantaneous flow during FY02 was 3.2 mgd (approximately 2,220 gallons per minute [gpm]) well within the WTP peak treatment capacity of 4.25 mgd (approximately 2,950 gpm) (Grams, 2003a).

Operation of the proposed NBACC Facility is projected to increase annual water consumption at Fort Detrick by approximately 13,456,000 gal, approximately 2.5 percent of the projected 546,111,004 gal/yr future Installation total (after completion of projects currently under construction or in design). The annual increase will be comprised of 20.5 million gal directly due

to
NBACC
Facility operations and an estimated increment of 3.1 million gal required by additional loading of the incinerators and steam boilers due to the NBACC Facility.

2.3.2.2 Electricity

Due to the energy-intense nature of research activities conducted at Fort Detrick, the demand for electricity at the Installation is high. During FY02, the total annual electrical consumption for the entire Installation was approximately 139 million kilowatt hours (kWh). The electrical consumption for the NBACC Facility is projected to be approximately 5,424,000 kWh/yr (approximately 3.6 percent of the projected future Installation total of approximately 151,949,410 kWh/yr).

The NBACC Facility will also require emergency backup generators to maintain essential laboratory operations during brief outages. In addition, new state-of-the-art energy efficient equipment will be used in the proposed NBACC Facility to minimize its energy demands.

2.3.2.3 Natural Gas

Natural gas usage at Fort Detrick is primarily by the boiler plant and the incinerators. During FY02, the total annual natural gas consumption for the entire Installation was approximately 5.66 million hundred cubic feet (ccf) (USAG, 2003a). The proposed NBACC Facility is projected to require approximately 528,000 ccf/yr of natural gas, approximately 8.4 percent of the estimated 6,327,336 ccf/yr future Installation total.

The boilers were designed to burn natural gas as a primary fuel and Number (No.) 6 fuel oil as a backup fuel (20 percent) during normal operations. However, during 2001-2003, natural gas tripled in price, which led to increased use of No. 6 fuel oil to as much as 60-70 percent. Therefore, the increased natural gas consumption resulting from operation of the proposed NBACC Facility may be less than the projected quantities above.

2.3.2.4 Steam

Existing boilers at Building 190 on Area A of Fort Detrick will produce most of the steam for sterilization purposes in the proposed NBACC Facility laboratories. Utility steam from these boilers is distributed throughout the Installation via under- and above-ground connections. During FY02, the boilers generated an annual total of approximately 566 million pounds (lbs) of steam. Additionally, steam is generated from waste heat boilers connected to incinerators via hot gas breeching. This allows the “heat of combustion” from incineration to be used as a heat source to generate steam in these boilers. Based on FY03 steam production data, approximately 17.1 percent of the steam production of the Installation was produced by the incinerators (Dressler, 2004a). Operation of the proposed NBACC Facility is estimated to require approximately 36,272,000 lbs/yr of steam, approximately 6.1 percent of the future Installation total of approximately 596,864,100 lbs/yr.

2.3.2.5 Energy Efficient Design of the NBACC Facility

The NBACC Facility will be designed to be efficient from an environmental and energy consumption perspective. Green Building is required by EO 12873 (*Federal Acquisition,*

Table 2-2. Projected Annual Utility Requirements and Waste Streams.

SERVICE	INSTALLATION FUTURE BASELINE [1]	PROJECTED NBACC FACILITY [2]	INSTALLATION UTILITY INCREASE
Utility Consumption			
Electricity (kWh)	151,949,410	5,424,000	3.6%
Water [3] (gal)	546,111,004	13,456,000	2.5%
Natural Gas (ccf)	6,327,336	528,000	8.4%
Steam (lb)	596,864,100	36,272,000	6.1%
Wastewater Processed			
Sanitary (gal)	319,897,577	9,419,200	3.0%
Potentially Contaminated [4] (gal)	12,895,910	3,488,000	N/A
Refuse/Solid Waste Disposal			
Municipal Solid Waste (lb)	9,271,988	111,200	1.2%
Medical Waste [5] (lb)	1,671,507	46,880	2.8%
Radiological Waste (Liters)	514	118	23.0%
Resource Conservation and Recovery Act (RCRA) Hazardous Waste (lb)	23,914	816	3.5%

[1] Calculated from data in the Installation Master Plan Environmental Assessment (EA) (USAG, 2003) and the FEIS for the NIH IRF.

[2] Projected from metrics based on USAMRIID facilities (495,000 gsf).

[3] Increased boiler and incinerator operations due to the IRF and the NBACC Facility are projected to require approximately 4,900,000 gal additional water consumption.

[4] Baseline potentially contaminated wastewater is decontaminated at the Steam Sterilization Plant before discharge to the Installation Wastewater Treatment Plant (WWTP). Potentially contaminated wastewater generated by the NBACC Facility will be decontaminated on-site and disposed of through the Installation sanitary sewer system.

[5] Baseline Hazardous and Radiological waste quantities do not include National Cancer Institute at Frederick (NCI-Frederick) wastes. Projected quantities generated at the IRF (765 lbs of Hazardous Waste and 111 Liters of Radiological Waste) are included in the Future Baseline.

Recycling, and Waste Prevention, dated 20 October 1993), and EO 13123 (*Greening the Government Through Efficient Energy Management*, dated 08 June 1999). Sustainable Design is synonymous with Green Building. Sustainable Design is the design, construction, operation, and reuse/removal of infrastructure and buildings in an environmentally and energy efficient manner. The major tenet of Sustainable Design is to meet the needs of the present without compromising the ability of future generations to meet their own needs. Sustainable Design includes efficient use of natural resources, better performing, more desirable, and more affordable infrastructure and buildings. Sustainable Design incorporates the energy efficiency concerns of the 1970s with present concerns related to damage to the natural environment; emissions of greenhouse gases and ozone depleting chemicals; use of limited material resources; management of water as a limited resource; reductions in construction, demolition and operational waste; indoor environmental quality; and occupant/worker health, productivity, and satisfaction.

2.3.3 POLLUTION PREVENTION AND WASTE STREAM MANAGEMENT

During the construction and operational phases of the proposed NBACC Facility, pollution prevention will be practiced through reduction or elimination of wastes and emissions of toxic materials to the environment, in accordance with the Pollution Prevention Act of 1990 (42 U.S. Code 133); EO 12856, *Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements* (August 1993); and EO 13101, *Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition* (September 1998).

Waste generated from laboratory activities at the proposed NBACC Facility will include municipal solid waste, regulated medical waste, hazardous chemical waste, radiological waste, and wastewater. Activities in the proposed NBACC Facility are expected to be similar to those of the existing USAMRIID facilities. On that basis, the projected waste generation by the proposed NBACC Facility is assumed to be proportional on a square foot basis to those of USAMRIID facilities (see Table 2-2), as documented in the Installation Master Plan (USAG, 2003a). The operational details of waste management for the NBACC Facility will be established in an interservice support agreement between DHS and USAG.

In accordance with BMBL guidelines (CDC/NIH, 1999), all waste contaminated or potentially contaminated with infectious material must be rendered noninfectious before disposal. This decontamination is accomplished by a combination of chemical and physical (autoclave) methods. All waste originating from BSL-3 and BSL-4 laboratories shall be decontaminated prior to leaving the laboratory.

2.3.3.1 Wastewater

Sanitary wastewater generated by the proposed NBACC Facility will be conveyed through the Installation's existing sanitary sewer system for treatment and disposal at the Fort Detrick Wastewater Treatment Plant (WWTP) in Area C, 0.8 miles to the east of Area A. The WWTP provides primary and secondary treatment and discharges treated effluent into the Monocacy River subject to NPDES Permit No. MD0020877, which became effective on 01 July 2004. See Section 4.15.1.3 for details on the WWTP.

All BSL-3 and BSL-4 laboratory wastewater generated in the proposed NBACC Facility will be sterilized within the building, in accordance with relevant Fort Detrick and Federal regulations.

Thus, the proposed NBACC Facility will not utilize the Fort Detrick LSS, which conveys the waste to the Steam Sterilization Plant (SSP) for sterilization.

Fort Detrick requires that all BSL-3 laboratory wastewater will be sterilized before being discharged into the Installation's sanitary sewer system (Brubaker, 2003). In accordance with this regulation and BMBL guidelines (CDC/NIH, 1999), all BSL-3 laboratory wastewater from the NBACC Facility will be sterilized within the laboratory prior to discharge to the sanitary sewer system.

All BSL-4 laboratory wastewater will be decontaminated twice prior to discharge to the sanitary system. The first decontamination, by autoclaving or by chemical treatment, will occur in the laboratory where the wastewater was generated. The wastewater is then discharged into a sealed drainage system, for a second decontamination by steam sterilization in a system of effluent decontamination tanks serving the entire NBACC Facility. The effluent decontamination system (biowaste) will be designed to provide sufficient capacity, monitoring and redundancy to ensure safe and reliable operation. Any exhaust from the sterilization tanks will pass through a double high-efficiency particulate air (HEPA) filter before venting to the exterior of the building.

These decontaminated laboratory wastewater streams will be combined and conveyed through the Installation's sanitary sewer system to the Fort Detrick WWTP for conventional secondary treatment before discharge into the Monocacy River. During FY02, the WWTP processed a total of approximately 259 million gal. Operation of NBACC Facility is expected to generate approximately 9,419,200 gal of wastewater per year, an increment of approximately 3.0 percent of the projected future Installation total of approximately 319,897,577 gal of wastewater per year.

2.3.3.2 Solid Waste

The municipal solid waste (i.e., excluding wastes from biomedical research and hazardous wastes) generated by the NBACC Facility will be managed in accordance with Federal, DA, USAG, and state regulations. The generators will sort municipal solid wastes before collection by the DIS for incineration and disposal. Waste materials that cannot be recycled are transported to the Incinerator Plant (Building 393) for processing in the two existing municipal waste incinerator units. Residual ash from the incinerators is transported by DIS personnel to the Fort Detrick Municipal Landfill located in Area B of the Installation for ultimate disposal. The overall solid waste operation holds MDE Refuse Disposal Permit 2000-WIN-0341-0.

During FY02, the Installation generated approximately 8.7 million lbs of municipal solid waste. Operation of the proposed NBACC Facility is estimated to generate approximately 111,200 lbs/yr of refuse, an increment of 1.2 percent of the projected future Installation total of approximately 9,271,998 lbs/yr of municipal solid waste.

2.3.3.3 Medical Waste

Medical waste generated at the NBACC Facility will be managed in accordance with BMBL guidelines (CDC/NIH, 1999) and applicable Federal, DA, USAG, and state regulations for the protection of transporters and the public from potential hazards associated with potential contaminants. Special Medical Waste, as defined under COMAR 26.13.11.02 includes anatomical material, blood, blood-soiled articles, contaminated material (microbiological

laboratory waste, feces of an individual diagnosed as having a disease that may be transmitted to another human being through the feces, articles soiled with feces of an individual diagnosed as having a disease that may be transmitted to another human being through the feces, or articles that have come into contact with a known infectious agent), microbiological laboratory waste (containing an infectious agent and including cultures or stocks of infectious agents and associated biologicals), and sharps (syringes, needles, surgical instruments, or other articles capable of cutting or puncturing human skin). Animal waste and bedding generated at the NBACC Facility will be specially bagged and managed as a medical waste. All medical waste will be incinerated in the Special Medical Waste Incinerators, in accordance with conditions of the MDE permit, as discussed in Section 4.15.3.

In FY02, the Installation's medical waste incinerators processed approximately 2.045 million lbs of medical waste. That value was significantly elevated compared to previous years due to a one-time additional loading, the burning of potentially anthrax contaminated materials from Federal facilities in the Washington DC area (see Section 4.15.3). For the purposes of this document, the existing medical waste baseline total is based on the approximately 1.62 million lbs/yr annual average value for medical waste incinerated during the three year period FY00, FY01, and FY02 (USAG, 2003a).

The NBACC Facility laboratory activities are projected to generate approximately 46,880 lbs of medical wastes annually, an increment of approximately 2.8 percent of the projected future Installation total of 1,617,507 lbs/yr.

2.3.3.4 Hazardous Waste

Hazardous waste generated at the NBACC Facility will be managed in accordance with applicable Federal, DA, USAG, and state regulations. During FY02, activities at Fort Detrick exclusive of National Cancer Institute at Frederick (NCI-Frederick) generated approximately 23,083 lbs of hazardous waste, as defined under the Resource Conservation and Recovery Act (RCRA). Laboratory activities at the NBACC Facility are projected to generate approximately 816 lbs of RCRA hazardous wastes annually, as shown in Table 2-2.

USAG will annually review waste streams generated, maintain records of all wastes generated, and comply with all state and local regulations and policies concerning hazardous waste. All hazardous waste material will be packaged in accordance with the U.S. Department of Transportation (DOT), Operational Services Command (OSC), Federal, state, and disposal facility requirements, and disposed of off-site (see Section 4.15.4).

2.3.3.5 Radiological Waste

Radiological waste generated at the NBACC Facility will be managed in accordance with applicable Federal, DA, USAG, and state regulations. During FY02, activities at Fort Detrick exclusive of NCI-Frederick generated approximately 403 Liters of low-level radiological waste under U.S. Nuclear Regulatory Commission (NRC) Licenses for use of gamma cell irradiators, radioisotopes, and Nickel-63 sources. Laboratory activities at the proposed NBACC Facility are projected to generate approximately 118 Liters of low-level radiological waste annually, as shown in Table 2-2.

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All radiological waste material generated by the proposed NBACC Facility will be packaged in accordance with NRC, DOT, OSC, Federal, state, and disposal facility requirements and will be disposed of off-site by a contractor.

2.3.4 SAFETY AND SECURITY

Personnel requirements will be defined as the design process unfolds. A preliminary estimate is that approximately 120 people, primarily research staff, will work in the proposed NBACC Facility. DHS personnel and USAG maintenance workers will be the primary personnel able to access the proposed NBACC Facility BSL-3 and BSL-4 laboratories since they may be the only workers immunized against the agents in use. All personnel working in the proposed NBACC Facility will be subject to the safety and security procedures specified for DHS personnel and will follow all applicable Federal, State, and local regulatory requirements for occupational health and safety.

2.3.4.1 Biosafety Levels

The laboratories in the proposed NBACC Facility will be comprised of biological containment suites designed and constructed to BSL-2, BSL-3, BSL-4, Animal Biosafety Level -2 (ABSL), ABSL-3, and ABSL-4 standards, following guidelines described in BMBL (CDC/NIH, 1999). These guidelines describe the four BSLs established for conducting laboratory operations with etiologic agents and/or their toxins. The BMBL also describes the four ABSLs for animal facilities and operations involving the use of animals infected or potentially infected with etiologic agents. DHS biological threat characterization and bioforensic operations and research activities at the proposed NBACC Facility will require the use of up to BSL-4 work practices and engineering controls because the activities performed involve potential exposure to etiologic agents and organisms. All BSL-2, BSL-3, BSL-4, ABSL-2, ABSL-3, and ABSL-4 facilities and activities at the proposed NBACC Facility will meet or exceed criteria set forth in the BMBL (CDC/NIH, 1999).

Personal protective equipment (PPE) includes gloves, respirators, goggles, face shields, positive pressure suits, and hearing protection as needed. In BSL-1 and BSL-2 areas, workers will wear a fully fastened laboratory coat. Personnel will wear special laboratory clothing in BSL-3, ABSL-3, BSL-4, and ABSL-4 areas. In addition to biological safety cabinets (BSCs) or other primary containment barriers, personnel will use careful techniques and follow specialized guidelines to maximize worker safety (CDC/NIH, 1999).

The BSL-4 areas will be designed for entry and exit through an airlock fitted with airtight doors, a chemical shower for decontamination upon exit, and change facilities. Authorized personnel entering BSL-4 space (suit area) will change into dedicated lab clothing and then put on a one-piece positive pressure suit protected by HEPA filtration. Air pressure within the suit is greater than the surrounding lab space, ensuring protection of the wearer. The air supply and other life-support systems for the positive-pressure suit will be provided with redundancy and emergency backup. The surface of the positive pressure suit and any objects taken out of the lab will be decontaminated using the chemical shower. The decontaminated suit is left in the change area. All clothing worn in the lab also remains behind and is sterilized out of the lab via autoclaving. The BSL-4 and ABSL-4 workers change into street clothes prior to exiting the biological containment areas.

Potenti
ally
contaminated work materials will not be removed from biological containment facilities until they are rendered innocuous by chemical disinfection or autoclaving. The chemical shower within the airlock is activated upon exit from the BSL-4 laboratory to decontaminate the exterior surfaces of the positive pressure suit and any objects taken out of the lab. Germicides may be used to disinfect BSCs, room surfaces, or exterior surfaces of certain items prior to their removal from BSL-3, ABSL-3, BSL-4, and ABSL-4 suites and in the chemical showers described above. A pass-through autoclave will be provided for decontamination of materials to be removed from the laboratory. The autoclave door that opens to the corridor outside of the biological containment suite will be sealed to the outer wall and automatically controlled so that it can only be opened after the autoclave sterilization cycle is complete. A pass-through surface decontamination system, fumigation chamber, or ultraviolet light treatment chamber will be available for decontaminating materials that cannot be autoclaved. In addition, the airlock will be sealed and used to decontaminate large items prior to removal from a BSL-3, ABSL-3, BSL-4, or ABSL-4 suite (CDC/NIH, 1999).

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Deleted: Two steam autoclaves are being considered for each biological containment suite for sterilization of small equipment.

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As noted above, items that cannot be autoclaved will be decontaminated using paraformaldehyde[3], ethylene oxide, or other approved gaseous fumigant (CDC/NIH, 1999). Formaldehyde, produced by heating paraformaldehyde flakes or prills, effectively decontaminates laboratories, equipment, materials, and air-handling systems. After the fumigation is complete, anhydrous ammonia (ammonium bicarbonate powder) will be used to neutralize the formaldehyde gas. Workers will not be allowed to re-enter the biological containment laboratories until the formaldehyde levels are below those considered harmful to human health.

2.3.4.2 Special Engineering Features

Laboratories designed to achieve BSL-3, ABSL-3, BSL-4, and ABSL-4 containment require special engineering features to control airflow. This can be accomplished under various design layouts. Each biological containment suite in the proposed NBACC Facility may consist of several rooms, each maintained under negative pressure (vacuum) to surrounding hallways to ensure a net flow of air into the suite. In addition, office space in the proposed NBACC Facility building may be maintained under positive pressure to the hallway. Within each suite air pressure differentials will be maintained as follows: change rooms and entry airlock highest, interior hallways next lower, and research laboratories and animal rooms lowest, i.e., most negative (CDC/NIH, 1999).

The BSL-4/ABSL-4 laboratories will have personnel airlocks with airtight doors for entry and exit (CDC/NIH, 1999). Use of double-door airlocks ensures that only one door can be opened at any time, thereby maintaining the proper air pressure differentials. Doors will be equipped with electronically controlled magnetic locks. Magnehelic gauges may be mounted adjacent to the

[3] A quarantine exemption under the provisions of Section 18 of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended, must be granted by the USEPA for this use of paraformaldehyde. All FIFRA registrations for use of paraformaldehyde to control microbial growth in laboratories and to decontaminate animal facilities were canceled due to nonpayment of fees by the manufacturer. Quarantine exemptions are authorized for 3 years. DoD and USDA have held exemptions for the use of paraformaldehyde to decontaminate certain high-containment microbiological laboratories (USEPA, 2003).

door of each biological containment laboratory and equipment room and above the emergency exit door of each suite to indicate the pressure differential.

The BSL-3, ABSL-3, BSL-4, and ABSL-4 suites will contain dedicated air supply and exhaust systems with alarms, back-up supply compressors, and HEPA filters. In addition, BSL-4 and ABSL-4 areas will have a duplicate air filtration units and exhaust fans, and an automatically activated emergency power source. Exhaust air from each suite will be passed through a HEPA filter (two HEPA filters in series for air from a BSL-4 lab). HEPA filters remove 99.97 percent of particles of 0.3 micrometers and larger, which are the most difficult to trap. This exhaust air will not be re-circulated to any other area of the building; it will be vented to the outside of the building away from high traffic areas at least 50 ft. from fresh air intakes. Procedures will be in place for certification and periodic inspection of all HEPA filters.

The BSL-4 and ABSL-4 suites will be entered through personnel airlocks with airtight doors (CDC/NIH, 1999). Emergency lighting and alarm systems will be provided. Each room in the biological containment areas will have its own temperature control and sprinkler systems. The laboratories will have visible and audible fire alarm systems (CDC/NIH, 1999).

The walls, floors, and ceilings of the BSL-3, ABSL-3, BSL-4, and ABSL-4 rooms will form a sealed internal shell that is pest-proof and facilitates cleaning and decontamination. All wall penetrations will be sealed, and the walls and floors may be painted with epoxy. In addition, the BSL-4 laboratory space will be built of airtight and sealed construction and all doors, windows will be carefully detailed and sealed to prevent air leakage. Emergency power will be provided for systems necessary to maintain the required safety and security of these laboratories.

BSCs in the laboratories and animal rooms will be maintained under negative pressure and will undergo semiannual or annual certifications for performance, in accordance with BMBL guidelines. Class II BSCs will be provided for most of the BSL-3/ABSL-3 and BSL-4/ABSL-4 laboratories. Some BSL-3 suites will be configured with Class III BSCs, which provide HEPA filtration of air exiting the cabinet and discharge directly into the laboratory exhaust system. Class III BSCs prevent introduction of an etiologic agent into the laboratory air during manipulation of etiologic agents and laboratory animals (CDC/NIH, 1999).

Floor drains in the BSL-3, ABSL-3, BSL-4, and ABSL-4 rooms will be filled with disinfectants or solutions appropriate for decontaminating the etiologic agent being studied in the laboratory. These drains will be connected to the liquid waste decontamination/ holding tank system for liquid wastes from laboratory sinks, BSCs, autoclaves, showers, and toilets. The holding tanks will be located in the basement of the proposed NBACC Facility. After thorough decontamination, the combined liquid wastes will be discharged into the Fort Detrick sanitary sewer system.

A dedicated central vacuum system serving the BSL-3, ABSL-3, BSL-4, and ABSL-4 laboratories will contain several in-line HEPA filters designed for in-place decontamination and replacement. Liquid and gas services will be protected with traps and/or filters to prevent backflow contamination.

Any aerosol testing conducted at the proposed NBACC Facility will be in compliance with BMBL guidelines (CDC/NIH, 1999). Typically, aerosol challenges using a small animal are conducted

in a
vacuum
and air-pressure driven unilaminar, dynamic flow system within a (gas-tight) Class III BSC. A small volume of a liquid suspension containing the etiologic agent undergoing testing, typically in the range of 10 milliliters (approximately 2 teaspoons), is placed in a nebulizer jar. Pressurized air supplied to the nebulizer forces the liquid out of several orifices, creating an aerosol of microscopic etiologic-agent suspension particles. The aerosol then flows through a stainless steel mixing tube into the animal exposure chamber. All workers who remove animals and decontaminate or remove items from a Class III BSC will wear PPE that protects them from potential exposure to the etiologic agent.

2.3.4.3 Other Safety Requirements

DHS will develop a Facility Safety Plan (FSP) for the NBACC Facility, which will set forth policies and procedures under which all planned biological threat characterization and bioforensics research and operational laboratory activities will be conducted. The FSP will detail the major potential hazards associated with operations and the mitigation measures employed to ensure safe operation. It will define the requirements for safety management and responsibility, personnel training, PPE and protective clothing, waste-handling procedures, inspections, spill and emergency procedures, hazard communication, and other elements essential to safety. All laboratory personnel will have to acknowledge in writing that they have read and understood the contents of the FSP. DHS also will oversee the safety program at the proposed NBACC Facility.

The FSP will incorporate Federal, state, and local laws and regulations pertaining to occupational health, safety, and the environment, including the safe use, handling, and disposal of etiologic agents, chemicals, and other potentially hazardous materials. Besides compliance with all relevant regulations for worker health and safety established by the Occupational Safety and Health Administration (OSHA), the FSP will embody standards developed by the NFPA for fire prevention and the BOCA for life safety. NFPA and BOCA standards frequently refer to the various construction codes, such as the National Electric Code, Plumbing Code, etc.

The FSP will include Standard Operating Procedures (SOPs) with detailed instructions for accomplishing specific tasks in a safe and efficient manner. All SOPs for the proposed NBACC Facility will be developed, approved, and implemented in accordance with procedures and responsibilities set forth in the FSP. The SOPs for all biological threat characterization and bioforensic operations and research activities of a potentially hazardous nature that will be performed at the proposed NBACC Facility will be in accordance with BMBL guidelines (CDC/NIH, 1999).

Occupational Health and Safety

Protective measures for worker health and safety will be implemented, including training, education, vaccination (immunization), and the medical monitoring of personnel (CDC/NIH, 1999). OSHA regulations govern required training programs in bloodborne pathogens (29 CFR 1910.1030), hazard communication (29 CFR 1910.1200), and occupational exposure to hazardous chemicals in the laboratory (29 CFR 1910.1450). The DHS Biosafety Officer will provide training programs on bloodborne pathogens, respiratory protection, laboratory safety operations, positive-pressure protective suit training, hazard communication, and chemical safety. All NBACC Facility laboratory personnel will be trained in unique procedures (e.g.,

laboratory entry and exit, autoclave and centrifuge operation, and waste disposal) pertaining to their department, and new personnel must attend a general training briefing. All training will be recorded and updated in a Minimal Essential Training Requirements document (CDC/NIH, 1999).

Personnel authorized to enter the BSL-3 and BSL-4 facilities will include researchers and technicians, and personnel providing operational support (facility engineering, medical maintenance, veterinary medicine, veterinary pathology, security, and safety). DHS personnel entering BSL-3 or BSL-4 suites will be included in a DHS-managed medical monitoring program. The medical monitoring program protocols will meet both U.S. Food and Drug Administration (FDA) requirements for administration of Investigational-New-Drug vaccines and other applicable Federal regulations. The participants in the medical monitoring program will be required to undergo complete medical evaluations and receive medical clearance prior to vaccinations. They must be informed of possible adverse reactions to the vaccine and sign an informed consent document.

The medical monitoring program will offer to vaccinate laboratory workers and support staff with investigational or licensed vaccines to protect individuals against infection with hazardous biological agents. While entry into an investigational vaccine program is considered equivalent to human clinical trial status and participation is voluntary, access to some of the biocontainment areas will require vaccination. Use of vaccines along with good microbiological technique and safety equipment are among routine primary containment procedures employed to protect personnel and the immediate lab environment (CDC/NIH, 1999). Vaccines do not exist for all known infectious microorganisms in the world, including some of those involved in biodefense research. In fact, it is often the need for vaccines that makes infectious diseases research a priority.

As noted above, individuals working in the labs will be offered immunization, to the extent that licensed or investigational vaccines are available for use. However, vaccines do not exist for BSL-4 agents. Workers unable to undergo vaccination for medical reasons will not be permitted to work with the associated etiologic agents and will not be permitted entry into containment suites where the vaccinations are required (CDC/NIH, 1999).

Maintenance workers and engineering staff who occasionally must enter BSL-3 and BSL-4 facilities will be enrolled in a medical monitoring program and receive biosafety training. Appropriate PPE will be provided for these workers, and if respirator use is required, the workers will be enrolled in a respiratory protection program that includes medical clearance for the use of a respirator (CDC/NIH, 1999). In addition, the work areas and equipment will be decontaminated, as deemed necessary, prior to service by the maintenance and engineering staff. The laboratory director will authorize entry into biological containment areas for these workers and any exception to the specific BSL-3 and BSL-4 area entry requirements.

Biological Safety

Biological threat characterization and bioforensic operations and research activities in the NBACC Facility will, by definition, involve pathogenic agents. Research on some of the pathogenic agents may include aerosol challenges. Therefore, the FSP will establish policies and procedures for the proposed NBACC Facility that mandate adherence to the BMBL guidelines and recommendations (CDC/NIH, 1999) for laboratory practices, techniques,

facilities
, and
equipment to contain pathogenic agents of varying degrees of pathogenicity and virulence. These measures have been developed to minimize risks to human health (workers and the community) and the environment.

All requests from investigators for a study involving etiologic agents will be reviewed by the laboratory directors, The review will include a risk assessment on a case-by-case basis for each agent, to determine the specific safety requirements. A registry of agents will be maintained to ensure that the area where the proposed work will be conducted meets the biological containment level required for the pathogenic agent.

Etiologic agents will be stored in secured refrigerators or freezers in laboratories or suites where access is restricted to authorized personnel. When work with a given pathogenic agent is completed, all remaining stocks will either be disposed of by autoclave or appropriate chemical decontamination or archived in a secured refrigerator or freezer (CDC/NIH, 1999).

An Institutional Biosafety Committee (IBC) will be established at the proposed NBACC Facility to assess and review issues associated with biological safety. The IBC will review and approve all research involving, but not limited to, recombinant deoxyribonucleic acid (DNA) molecules. In accordance with the *NIH Guidelines for Research Involving Recombinant DNA Molecules* (Section IV-B-2, April 2002), at least two members of the IBC shall not be affiliated with the institution (apart from their membership on the IBC) and who represent the interest of the surrounding community with respect to health and protection of the environment (i.e., officials of state or local public health or environmental protection agencies, members of other local governmental bodies, or persons active in medical, occupational health or environmental concerns in the community).

Chemical Safety

Activities conducted at the proposed NBACC Facility may require the use of certain hazardous chemicals. Policies and procedures for the safe handling and use of chemicals will be contained in a Chemical Hygiene Plan (CHP) as required by OSHA regulations (29 CFR 1910.1450, *Occupational Exposure to Hazardous Chemicals in Laboratories*). The CHP and laboratory-specific procedures will provide information about handling controlled substances, chemical acquisition, chemical storage, potential health risks, environmental monitoring, PPE, use of fume hoods, safety procedures, inspections, and laboratory audits. In accordance with these regulations, written safety policies and procedures will be available for all laboratory personnel.

A Hazard Communication Program will be developed to meet the requirements of 29 CFR 1910.1200, *Hazard Communication*. It will apply to all personnel who work with or may be exposed to hazardous chemicals under normal conditions of use, other than “laboratory use” as defined in 29 CFR 1910.1450, or in a foreseeable emergency.

Policies and procedures for the handling of hazardous chemicals will be in accordance with 29 CFR 1910.1450. Medical monitoring, preparation of written training and operational protocols, use of Material Safety Data Sheets (MSDSs) and labels, and the certification of safety apparatus will be required. In addition, 29 CFR 1910.1450 describes plan implementation and managerial responsibilities. SOPs for the safe use, handling, and disposal of hazardous material

will be availabl e in work areas. The NBACC Facility's Chemical Hygiene Officer will maintain an inventory of chemicals in use.

Radiological Safety

The NBACC Radiation Safety Office will oversee all activities involving the use of radioisotopes and X-ray equipment. DHS will follow the requirements of a NRC license. Any X-ray facilities in the proposed NBACC Facility will adhere to applicable Federal and state regulations. In the event radioisotopes are used, the DHS Radiation Safety Office will develop the procedures and regulations to provide a safe working environment to those who come in contact with radioactive material and waste. Procedures for safe handling of radiological materials and wastes will be detailed in a Radiological Safety Manual. Use of radioisotopes in the proposed NBACC Facility laboratories will be authorized with the approval of the DHS Radiation Safety Office, in coordination with the USAG Radiation Safety Committee (RSC).

Public Health and Safety and Emergency Services

The Emergency Response Plan (ERP) for the proposed NBACC Facility will be integrated with Fort Detrick Installation-wide plans. It will include response to bomb threats, power outages, and other man-made incidents in addition to natural disasters (e.g., hurricane, flood, or earthquake). Procedures will be in place for notification of, and response by, the laboratory and AF directors, laboratory workers, and designated emergency response personnel when an emergency occurs. The ERP will be reevaluated at least annually, including exercises to test its effectiveness.

In accordance with BMBL guidelines (CDC/NIH, 1999) DHS will coordinate emergency preparedness with local emergency service providers and maintain formalized agreements describing the specifics of emergency support. The Fort Detrick Fire Department will provide emergency services including fire, emergency medical services, and hazardous materials response for the proposed NBACC Facility.

A Mutual Aid Agreement (MAA) for the coordination of emergency medical services between the Army and Frederick County and the Frederick County Volunteer Fire and Rescue Association, Inc. became effective on 01 October 2002. The Frederick County Volunteer Fire and Rescue Association, Inc. represents the volunteers who provide local emergency medical services. Prior to operation of the NBACC Facility, a MAA will be prepared between DHS and Frederick County, or alternatively, DHS may become a signatory to the existing MAA, to ensure compliance with community right-to-know statutes and regulations (U.S. Code [USC] 42, Title 42, Chapter 116, *Emergency Planning and Community Right-To-Know Act*). This agreement will include provisions for emergency response and notification for members of the public. USAG will be installing an emergency siren and notification system. The six sirens will be designed to notify employees and residents of an emergency through a live and digital voice messaging system. Solar signs at each of the gates will flash and instruct drivers to tune to AM 1610.

The Frederick County, Maryland *Ad Hoc* Local Emergency Planning Committee (LEPC) has developed plans in the event of a terrorist attack on the county (Frederick County, Maryland *Ad Hoc* LEPC, 2002). The LEPC is a cooperative effort involving officials of public health and law enforcement agencies of Frederick County and the City of Frederick, together with

represe
ntatives
of the Frederick County Chapter – American Red Cross, private individuals, and representatives of USAG and USAMRIID.

This plan includes an implementation strategy at the local level for preparedness, response, recovery, and mitigation of bioterrorism. The main purpose of this program is to protect Frederick Memorial Hospital and maintain its service as a medical facility for the community. The plan is consistent with the CDC draft *Guidelines for State and Local Public Health Bioterrorism Response Planners*, and the recommended guidelines of the DoD *Mass Casualty Care Strategy for Biological Terrorism Incidents*.

Accidents and Incidents

A hazard analysis and job safety evaluation will be performed prior to work involving etiologic agents, as required under BMBL guidelines (CDC/NIH, 1999). The purpose of performing a hazard analysis is to carefully consider the range of potential consequences that might result from an accident during each type of potentially hazardous activity performed. Such an analysis provides a way to assess whether existing safeguards are adequate to protect human health and the environment.

Policies and procedures will be in place for reporting and investigating all exposures and potential exposures that occur in biological containment laboratories in the proposed NBACC Facility. DHS will identify a medical support facility for the hospitalization and treatment of personnel from the proposed NBACC Facility who are exposed to etiologic agents, or who become ill from a suspected occupational disease

Laboratory safety at research facilities similar to the proposed NBACC Facility is excellent nationwide. Significant impacts to worker health resulting from similar work have not been observed at existing biomedical laboratories in the United States. The limited number of documented cases of Laboratory Acquired Illnesses (LAIs) during the last 10 years in biomedical laboratories throughout the U.S. demonstrates the effectiveness of these mitigation measures (USAMRMC, 2004; Johnson, 2003; Harding and Byers, 2000; CDC/NIH, 1999; Sewell, 1995).

Fort Detrick Fire Department personnel will be the first responders to the proposed NBACC Facility in the event of a medical incident involving an individual from a laboratory area. Emergency service personnel from outside of Fort Detrick will not enter any of the NBACC Facility biocontainment laboratory areas. In the event of a medical emergency involving personnel in a BSL-4 laboratory, NBACC Facility safety personnel will quickly decontaminate and remove the positive pressure suit worn by the individual in medical distress. The Fort Detrick Fire Department will then transfer the individual to outside emergency service personnel for transportation to the nearest medical facility capable of handling the medical emergency. Exercises will be conducted annually with first responders to maintain their skills and familiarity with the operations and configurations of the laboratories in the proposed NBACC Facility.

2.3.4.4 Animal Care and Use

Some of the biological threat characterization and bioforensic operations and research activities conducted in the proposed NBACC Facility will use animal models. The total number of

laboratory animals required will vary depending on the program-specific test requirements. Animals used for research in the proposed NBACC Facility will be obtained from commercial vendors.

Protocols and procedures will be in place for an Animal Program, with oversight by an Animal Care and Use Committee (ACUC), including research protocol reviews, training reviews, and semiannual facility inspections. In accordance with U.S. Public Health Service Policy on Humane Care and Use of Laboratory Animals, at least one member of the ACUC shall be an individual who is not associated with DHS in any way other than as a member of the ACUC. Animal handling practices and the quality of laboratory animal care will be in accordance with standards set forth in the *Guide for the Care and Use of Laboratory Animals* (National Research Council, 1996). Accreditation by the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC) will be sought by DHS.

The Animal Program Director (APD) will perform various professional, technical, and service functions for the NBACC Facility and its scientists. The primary responsibility of the APD is to provide support, research, and consultation in laboratory animal medicine; attending veterinary care; comprehensive animal husbandry; training in laboratory animal medicine, science, and animal care and use procedures; and review of research protocols for proper and lawful animal use. The APD will conduct safety reviews, risk assessments, and at least semi-annual inspections of all animal facilities. NBACC will develop SOPs that specify Administrative Guidelines; Feed, Bedding, and Water; Animal Procurement and Care; Facility and Equipment Operations; and Procedures for Waste Disposal, Sanitation, and Sterilization.

The APD will report to the Director, who will be responsible for implementing and administering animal use policies and serve as a liaison between the APD and scientists and DHS officials. The Director will also responsible for ensuring participation in the Animal Exposure Surveillance Program (AESP) by all researchers who will work with animals. The AESP will be a mandatory surveillance program that will be managed by the Occupational Medical Service, and individuals who elect out of the program will be denied permission to participate in animal studies.

Research involving rodents and lagomorphs (i.e., rabbits) will be performed in the biocontainment suites of the proposed NBACC Facility. Animals will be held in species-specific animal housing within biocontainment animal rooms. All animal studies involving etiologic agents will be conducted at BSL-2, 3, or 4. The procedure for removal of rodents and lagomorphs from the biocontainment suites will involve euthanizing any live animals and then autoclaving the carcasses.

Non-human primates (NHPs) will also be used in animal models in the proposed NBACC Facility. Housing areas for the NHPs within the proposed NBACC Facility will follow all Federal, state and local guidelines and regulations. PPE used in NHP housing areas will follow guidelines outlined in the BMBL (CDC/NIH, 1999).

NHPs within ABSL-2 suites containing only non-transmissible, nonlatent infectious agents may be removed from the suite provided that they are healthy and demonstrably immune to all of the agents in use. NHPs previously infected with transmissible agents will only be removed to other biocontainment suites with an equal or higher level of biocontainment. Removal to other biocontainment suites will be coordinated with the APD, and will be done only if the principal investigator and Scientific Director are informed and concur with the movement. If infected

NHPs are transported between suites, they will be transported in sealed and appropriately disinfected leakproof containers. The containers will be sterilized after the animals are removed. NHPs in suites where transmissible possible latent agents are used will be treated as potentially infected with these agents.

2.3.4.5 Transportation of Etiologic Agents and Registration of Facilities

The proposed NBACC Facility will apply for registration with the CDC, in accordance with 42 CFR 73 (*Additional Requirements for Facilities Transferring or Receiving Select Agents)*. Packaging and shipment or transport of etiologic agents will be conducted in accordance with the requirements of 42 CFR 72 (*Interstate Shipment of Etiologic Agents*), 49 CFR 171-180, and other applicable Federal, state and local regulations (CDC/NIH, 1999). Also in accordance with these requirements, the transfer of select agents to and from the NBACC Facility will be documented and reported to the CDC. Procedures will be in place to obtain the required permits (from USDA, U.S. Department of Commerce, DOT, U.S. Public Health Service, or the International Air Transportation Association), as needed, for transport and use of select pathogenic agents.

Transportation of select agents or toxins regulated by CDC under 42 CFR 73 is subject to written security plans to address the associated risks. In accordance with Department of Transportation regulations (49 CFR 172.800), DHS will develop a Transportation Security Plan (TSP) applicable for select agents or toxins that are transported in commerce to or from the proposed NBACC Facility. This TSP will set forth policies and procedures for personnel security, unauthorized access, *en route* security, and security training requirements. The personnel security provisions will include measures to confirm information provided by applicants hired for positions involving access to and handling of select agents or toxins and apply to Federal employees and contract employees. The provisions to address potential access by unauthorized personnel to hazardous materials or transport vehicles will cover physical security, driver identification, vehicle inspection, and escorting of unauthorized personnel. The *en route* security provisions will include due diligence of the transporters' security plans and tracking of select agent or toxin shipments.

2.3.4.6 Safety Inspections

Safety inspections will be an integral part of operations in the proposed NBACC Facility. NBACC will conduct semi-annual inspections of all laboratories, and the supervisors will be required to conduct more frequent inspections of their work areas. Inspections of BSL-3, ABSL-3. BSL-4, and ABSL-4 facilities will be more frequent. NBACC will develop Laboratory Safety Inspection Checklists for each level of BSL and ABSL laboratories, incorporating the physical standards and procedural requirements as described in the BMBL (CDC/NIH, 1999), as well as applicable regulatory requirements under OSHA and provisions of 42 CFR 73 and 42 CFR 72 (see Section 2.3.4.5).

2.3.4.7 Security

The security of the operation of the proposed NBACC Facility will be in accordance with the requirements set forth in the *Patriot Act of 2001* (Public Law 107-56), *Public Health Security and Bioterrorism Preparedness and Response Act of 2002* (Public Law 107-188), *Agricultural*

Bioterrorism Protection Act of 2002, Additional Requirements for Facilities Transferring or Receiving Select Agents (42 CFR 73), and *Interstate Shipment of Etiologic Agents* (42 CFR 72).

DHS will develop a site-specific Facility Security Plan during the design of the proposed NBACC Facility, based on a risk assessment and threat analysis of the assets and the planned Select Agents. It will address physical security, security for data and the information technology system, security policies for personnel, policies governing access to Select Agent areas, specimen accountability, receipt of Select Agents into the laboratories, transfer or shipping of Select Agents from the laboratories, emergency response, and reporting of incidents, injuries, and breach of security. The Facility Security Plan will set forth responsibilities for associated personnel training and periodic performance testing of the security systems. Policies and procedures in the Facility Security Plan will be revised as necessary, based on mandatory reviews occurring at least annually and after any incident or change in the above regulatory requirements.

Physical Security

The Fort Detrick Provost Marshal Office (PMO) has responsibility for security services for the Installation. Access to the proposed NBACC Facility will be controlled through three concentric rings of security. The outer ring is comprised of the four gates described in Section 4.13 and the Installation's outer security fence. USAG will provide the middle ring of access controls surrounding the NIBC. DHS will provide the access controls for the proposed NBACC Facility.

Local threat assessment for Fort Detrick, Maryland and the NIBC Master Plan at Fort Detrick has been studied by the USAG Security Plans, Operations and Force Protection. The result of this study was to assign a threat/risk of Low Level for the Installation. In subsequent discussions with the Installation Commander, U.S. Army Anti-terrorism / Force Protection (ATFP) representatives and Health Facility Planning Agency (HFPA) representatives, it was agreed that the design standards for Force Protection for the NIBC Master Plan would be upgraded to a Medium Level of Protection, but the facility would normally operate at a Low Level of Protection unless the need arose to elevate the Level of Protection (Thompson, 2004).

The proposed NBACC Facility will be secured at all times, and entry into the building will be controlled. This will include physical barriers and fences to limit vehicular access, a guard station, an electronic access control system (card readers, access alarms, etc.) and an automatic magnetic locking system. Exterior and interior closed circuit television cameras will be used to monitor physical security 24 hours per day. Parking will be controlled, and a safe zone will be established around the facility. Security staff will control visitor access to the NBACC Facility.

Security Policies for Personnel

The Facility Security Plan will include policies and procedures for screening NBACC personnel (both DHS employees and contractors) who work with Select Agents; visitors who need access to Select Agent areas; and maintenance, cleaning or repair personnel for the biological containment areas. Access to select agent areas will be accorded only to authorized personnel cleared by the U.S. Department of Justice in accordance with 42 CFR 73. All others (visitors, maintenance and repair personnel, and service workers) must be escorted and monitored by

authorized personnel. Contract security guards who are assigned to facilities that house Select Agents will undergo a Public Trust Level 5 (*National Agency Check and Inquiries*) background investigation, which requires completion of the Questionnaire for Public Trust Positions (Standard Form 85P).

Access Control

The proposed NBACC Facility will be designed to consolidate the laboratories as much as possible and to separate the Select Agent areas from public areas of the building. The Facility Security Plan will identify methods for secure access (e.g., electronic locking keys, combination keypads, and/or biometrics) and monitoring controls (e.g., video surveillance cameras). Records will be kept of all entries into Select Agent areas, including visitors and maintenance or service workers. Procedures will be in place for reporting and removing unauthorized persons.

The proposed NBACC Facility building will be divided into security zones, with each area of increasing hazard having a corresponding level of increasing security. Building security will include automatic access controls and security screening equipment at each level of the facility. Entry into the biological containment areas will be restricted by a badge system using proximity readers as well as electronic biometric devices that may require a personal identification number. The access control systems, including alarms and closed circuit television cameras, will be continuously monitored.

Select Agent Accountability

The Facility Security Plan will include an accounting procedure in accordance with the Patriot Act of 2001 (Public Law 107-56) to ensure adequate control of select agents and to maintain an up-to-date inventory of seed stocks, toxins, and agents in long-term storage. NBACC will maintain a registry of biological and toxin agents in use at the proposed NBACC Facility. This will include data on agent location, use, storage method, inventory, records of internal and external transfers (sender, recipient, date, and quantity), further distribution, and records of destruction (method, quantity, date, and contact information). Accurate and up-to-date records of authorizations for entry into limited-access areas will be maintained by DHS (e.g., a current list of individuals who possess keys or cardkeys or who have knowledge of keypad access numbers).

The proposed NBACC Facility will be designed with a centralized receiving area for maximum safety and minimum security hazards associated with damaged or unknown packages. All incoming packages will be inspected visually and/or by noninvasive techniques, e.g., X-ray, before admittance into the biocontainment areas. Procedures will be in place for handling suspicious packages as prescribed by Federal and state law enforcement agencies. All packages containing specimens, bacterial or viral isolates, or toxins will be opened only by authorized personnel, with appropriate training and using BSCs or other appropriate containment devices.

Access to etiologic agents will be restricted. This could include use of an Agent Repository (located inside a biological containment suite), with entry into the Agent Repository limited to only a few selected personnel. Entry will be restricted by state-of-the-art access control devices, and the entry procedure will be directly monitored electronically by security personnel. Also,

voice
confirm
ation may be required upon entry and exit, with the password for entry changed frequently.

Select Agents will be stored securely in monitored biological containment areas that are secured by state-of-the-art access control devices, and the entry procedure will be directly monitored electronically by the security personnel. Only individuals who are cleared to work with Select Agents will have access to such freezers or refrigerators.

Incident Reporting

Policies and procedures will be in place for reporting and investigating all unintentional injuries, breaches of security measures (e.g., unauthorized personnel in restricted areas or missing etiologic agents or toxins), unusual or threatening phone calls, or other incidents. If materials containing a Select Agent are discovered to be missing, released outside the laboratory, involved in a worker exposure or infection, or misused, immediate notification of appropriate authorities, including USAG and DHS will occur.

Deleted: In addition, incidents involving Select Agents (e.g., occupational exposure or a breach of primary containment) should be reported to local and state public health authorities.

2.3.4.8 Biosurety

DHS will develop a biosurety program for the proposed NBACC Facility that will likely incorporate features of programs currently under development at USAMRIID, as described recently in the open literature (Carr *et al*, 2004). The program will address agent accountability, security, personnel reliability, and safety.

Agent Accountability

Agent accountability has the objective that all agent stocks in the facility are registered and can be precisely located, including both working and archived stock. However, biological agents do not lend themselves to exact counts. Microorganisms are replicating entities. In the case of bacterial and viral agents, physical particle counts do not correspond with the number of viable organisms in the culture, and the viability of most biological agents, including spore preparations, degrades over time. In addition, various types of container may be used to store agents, depending on the storage volume requirements for specific experimental studies, the method of preservation, and the characteristics of the agent.

Agent accountability relies on the laboratory workers to maintain accurate records in laboratory notebooks to track working and reference stocks of the specified agents in and out of storage, and to recording consumption in the experimentation. Agent accountability will be enhanced by limiting access to the biological agents. See also Section 2.3.4.5 and Section 2.3.4.7 (Select Agent Accountability) for other requirements related to select agent accountability.

Security

Security directed to detecting intrusion by outsiders is provided by procedures and engineering features to monitor their presence and activities and to control their potential access to the biological agents. Security directed to intrusion by the laboratory workers is a more complicated issue. Video surveillance monitoring may be used as a countermeasure to detect unauthorized acts with biological agents, and would provide real-time evaluation of laboratory operations and a historical record, if needed. Guidelines will be established to ascertaining what constitutes an

"unauthorized act." Each transgression, real or otherwise, requires careful scrutiny and evaluation. See Section 2.3.4.7 for a more detailed discussion of security practices which will be employed once the NBACC Facility is operational.

Personnel Reliability

None of the proposed accountability measures above can provide an absolute guarantee that a determined individual could not divert a select biological agent. Security ultimately depends on the dependability and trustworthiness of the laboratory workers. A personnel reliability program is required to ensure that each person who has access to sensitive materials meets the highest standards of reliability.

All personnel who have access to select biological agents will be initially screened using a background investigation and enrolled in a personnel reliability program. This would preclude enrollment of individuals who violate the *USA Patriot Act*. It may also require mental and medical evaluations and random urinalyses to detect abuse of prohibited substances. All individuals in the program will complete a favorably adjudicated personnel security investigation screening and personal interview with a certifying official (higher levels of security investigation may be required to work with the biological select agents). The personnel reliability program may also enroll certifying officials, security personnel, and facilities engineers.

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